AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application. Kindly cancel claims 1-28, 30-43, 45 and 47, and add new claims 48-85 as follows:

Listing of Claims:

1. (canceled) A film measurement apparatus comprising:

a light source configured to generate a light signal;

means for directing said light signal onto a patterned sample to obtain a reflected or transmitted light signal having a plurality of wavelength components, each having an intensity;

a one-spatial-dimension imaging spectrometer configured to receive said reflected or transmitted light signal, and derive therefrom a one-spatial-dimension spectral image comprising, for each of one or more locations represented by the image, a plurality of electrical signals, each representative of the intensity of a wavelength component of the reflected or transmitted light at the location;

a translation mechanism to relatively translate the sample relative to the light source; and

a computer configured to control the translation mechanism to relatively translate the sample relative to the light source so that said one-spatial-dimension imaging spectrometer combines a plurality of one-spatial-dimension spectral images to the computer for combination therein to produce a two-spatial-dimension spectral image, and the computer is further configured to locate one or more measurement locations on or from said two-spatial-dimension spectral image, and derive one or more measurements of at least one property of at least one film of said sample from spectral information obtained from said one or more measurement locations.

2. (canceled) The apparatus of claim 1 in which the translation mechanism moves the sample relative to the light source.

3. (canceled) The apparatus of claim 1 wherein the computer is configured to form a two-spatial-dimensional image from the plurality of one-spatial-dimensional images, analyze the two-dimensional image to find one or more predetermined measurement locations, and measure one or more film properties from spectral information obtained at the one or more predetermined locations.

4. (canceled) The apparatus of claim 1 where other film properties besides film thickness, such as optical constants and doping density, are determined from the spectral reflectance data.

5. (canceled) The apparatus of claim 1 where the sample translation mechanism is an integral part of equipment used for the manufacture of semiconductor microelectronics.

6. (canceled) A film measurement apparatus comprising:

a light source configured to generate a light signal;

a one-spatial-dimension imaging spectrometer configured to receive light from said light source that has been reflected or transmitted by a patterned sample, and derive therefrom a one-spatial-dimension spectral image comprising, for each of one or more locations represented by the image, a plurality of signals, each signal representative of the intensity of a wavelength component of the reflected or transmitted light at the location; and

a computer configured to receive from said one-spatial-dimension imaging spectrometer a plurality of one-spatial-dimension spectral images representative of a region of a sample, combine the plurality of one-spatial-dimension spectral images to form a two-spatial-dimension spectral image, locate one or more measurement locations on or from said two-spatial-dimension spectral image, and derive, from spectral information obtained from the one or more measurement locations, one or more measurements of one or more properties of at least one film of said sample.

7. (canceled) The apparatus of claim 6 where a translation mechanism is used to move the measured sample relative to the one-spatial-dimension imaging spectrometer to obtain a series of one-spatial-dimension spectral images of the sample.

8. (canceled) The apparatus of claim 6 where a translation mechanism is used to move the one-spatial-dimension imaging spectrometer relative to the measured sample to obtain a series of one-spatial-dimension spectral images of the sample.

9. (canceled) The apparatus of claim 6 where moving mirrors or lenses are used to obtain a series of one-spatial-dimension spectral images of the sample.

10. (canceled) The apparatus of any of claims 7, 8, or 9 where the resultant one-spatial-dimension spectral images are combined to form a two-spatial-dimension image of the sample.

11. (canceled) The apparatus of claim 10 wherein at least one wavelength component of said two-spatial-dimension spectral image is analyzed to find one or more pre-determined

measurement locations, and measurements of one or more film properties are derived from spectral information obtained at the one or more pre-determined measurement locations.

12. (canceled) The apparatus of claim 6 where the film property to be determined is thickness.

13. (canceled) The apparatus of claim 6 where the film property to be determined is refractive index.

14. (canceled) The apparatus of claim 6 where the film property to be determined is extinction coefficient.

15. (canceled) The apparatus of claim 6 where the one-spatial-dimension imaging spectrometer communicates the measured light intensity to the computer via an optical communication link.

16. (canceled) The apparatus of claim 6 where the one-spatial-dimension imaging spectrometer communicates the measured light intensity to the computer via wireless communications.

17. (canceled) The apparatus of claim 7 where the sample translation mechanism is an integral part of equipment used for the manufacture of semiconductor microelectronics.

18. (canceled) A method of measuring one or more properties of at least one film of a patterned sample by:

forming a plurality of one-spatial-dimension spectral images, representative of a region of the sample, from light reflected off of or transmitted through the sample, each image comprising, for each of one or more locations represented by the image, a plurality of signals, each representative of a wavelength component of the reflected or transmitted light at the location;

combining the plurality of one-spatial-dimension spectral images to form a two-spatial-dimension spectral image;

locating one or more measurement locations on or from the two-spatial-dimension spectral image; and

analyzing spectral data obtained from the one or more measurement locations to determine one or more measurements of one or more properties of the film.

19. (canceled) The method of claim 18 further comprising successively formed one-spatial dimension spectral data representative of successive portions of the sample.

20. (canceled) The method of claim 19 where the successively formed spectral data representative of successive portions of the sample are combined to form a two-spatial-dimension spectral image of the sample.

21. (canceled) The method of claim 20 further comprising determining one or more measurement locations from the two-spatial-dimension spectral image of the sample, and deriving a measurement of one or more properties of one or more films of the sample from spectral information obtained from one or more of the measurement locations.

22. (canceled) The method of claim 18 wherein the film property to be determined is thickness.

23. (canceled) The method of claim 18 where the film property to be determined is refractive index.

24. (canceled) The method of claim 18 where the film property to be determined is extinction coefficient.

25. (canceled) A film measurement system comprising:

a light source configured to generate a light signal;

a one-spatial-dimension imaging spectrometer configured to receive light from said light source that has been reflected or transmitted by a patterned sample, and derive therefrom a one-spatial-dimension spectral image comprising, for each of one or more locations represented by the image, a plurality of signals, each signal representative of the intensity of a wavelength component of the reflected or transmitted light at the location; and

a computer configured to receive from said one-spatial-dimension imaging spectrometer a plurality of one-spatial-dimension spectral images representative of a region of the sample, combine the plurality of one-spatial-dimension spectral images to form a two-spatial-dimension spectral image, locate one or more measurement locations on or from the two-spatial-dimension spectral image, and derive, from spectral data obtained from the one or more measurement locations, one or more measurements of one or more properties of at least one film of said sample.

26. (canceled) The system of claim 25 further comprising a translation mechanism which is used to move the sample relative to the light source to obtain a series of one-spatial-dimension spectral images of a region of the sample.

27. (canceled) The system of claim 25 further comprising a translation mechanism which is used to move the light source relative to the sample to obtain a series of one-spatial-dimension spectral images of a region of the sample.

28. (canceled) The system of claim 25 where moving mirrors or lenses are used to obtain a series of one-spatial-dimension spectral images of the sample.

29. (canceled) The system of any of claims 26, 27, or 28 where the resultant one-spatial-dimension spectral images are combined to form a two-spatial-dimension image of the sample.

30. (canceled) The system of any of claims 26, 27, or 28 where at least one wavelength component of said two-spatial-dimension spectral image is analyzed to find one or more pre-determined measurement locations, and measurements of one or more film properties are derived from spectral information obtained at the one or more pre-determined measurement locations.

31. (canceled) The system of claim 25 where the film property to be determined is thickness.

32. (canceled) The system of claim 25 where the film property to be determined is refractive index.

33. (canceled) The system of claim 25 where the film property to be determined is extinction coefficient.

34. (canceled) The system of claim 25 where the one-spatial-dimension imaging spectrometer communicates the measured light intensity to the computer via an optical communication link.

35. (canceled) The system of claim 25 where the one-spatial-dimension imaging spectrometer communicates the measured light intensity to the computer via wireless communications.

36. (canceled) The system of claim 26 where the sample translation mechanism is an integral part of equipment used for the manufacture of semiconductor microelectronics.

37. (canceled) The apparatus of claims 1 or 6 wherein said one-spatial-dimension spectral image is a line image.

38. (canceled) The method of claim 18 wherein said one-spatial-dimension spectral image is a line image.

39. (canceled) The system of claim 25 wherein the one-spatial-dimension spectral image is a line image.

40. (canceled) A system for measuring one or more properties of one or more films of a patterned sample comprising:

means for generating light;

means for directing the light to the sample;

means for receiving light reflected from or transmitted through the sample, and deriving therefrom a one-spatial-dimension spectral image comprising, for each of one or more locations representing by the image, a plurality of signals, each representative of a wavelength component of the reflected or transmitted light at the location;

means for relatively translating the generating means and the sample; and

means for combining a plurality of one-spatial-dimension spectral images from said means for receiving to form a two-spatial-dimension spectral image, locating one or more measurement locations on or from the two-spatial-dimension spectral image, deriving one or measurements of one or more properties of one or more films of said sample from spectral information obtained from said one or more measurement locations.

41. (canceled) A method of measuring one or more properties of one or more films of a patterned sample comprising:

a step for generating light from a generating means;

a step for directing the light to the sample;

a step for deriving, from light reflected from or transmitted through the sample, a plurality of one-spatial-dimension spectral images, each comprising, for each of one or more locations represented by the image, a plurality of signals, each representative of a wavelength component of the received or transmitted light at the location;

a step for combining the plurality of one-spatial-dimension spectral images to form a two-spatial-dimension spectral image;

a step for locating one or more measurement locations on or from said two-spatial-dimension spectral image;

a step for deriving, from spectral information obtained from the one or more measurement locations, one or more measurements of one or more properties of one or more films of said sample.

42. (canceled) A system for measuring one or more properties of one or more films of a patterned sample comprising:

a light source for generating light;

one or more optical elements for directing the light to the sample;

a one-spatial-dimension spectrometer for receiving light reflected from or transmitted through the sample, and deriving therefrom a one-spatial-dimension spectral image comprising, for each of one or more locations represented by the image, a plurality of signals, each representative of a wavelength component of the reflected or transmitted light at the location;

a translation mechanism for relatively translating the light source and the sample; and

a processor for controlling the translation mechanism to relatively translate the light source and the sample, so that the spectrometer produces a plurality of one-spatial-dimension spectral images, and the processor combines the plurality of one-spatial-dimension spectral images to form a two-spatial-dimension spectral image, locates one or more measurement locations on or from the two-spatial-dimension spectral image, and derives one or more measurements of one or more properties of one or more films of the sample from spectral information obtained from the one or more measurement locations.

43. (canceled) A method of measuring one or more properties of one or more films of a patterned sample comprising:

generating light from a light source;

directing the light to the sample;

deriving, from light reflected from or transmitted through the sample, a plurality of one-spatial-dimension spectral images, each comprising, for each of one or more locations represented by the image, a plurality of signals, each representative of a wavelength components of the reflected or transmitted light at the location;

combining the plurality of one-spatial-dimension spectral images to form a two-spatial-dimension spectral image;

locating one or more measurement locations on or from the two-spatial-dimension spectral image; and

deriving one or more measurements of one or more properties of the one or more films from spectral information obtained from the one or more measurement locations.

44. (canceled) The system of claim 42 wherein the processor forms a two-dimensional image from the plurality of one-spatial-dimensional spectral images, and derives the measurement from spectral information obtained from the two-dimensional image.

45. (canceled) The system of claim 43 wherein the processor analyzes the two-dimensional image to find one or more predetermined measurement locations, and derives one or more measurements from spectral information obtained from the two-dimensional image at the one or more predetermined measurement locations.

46. (canceled) The method of claim 43 wherein the second deriving step further comprises forming a two-dimensional image from the plurality of one-spatial-dimension spectral images, and deriving the measurement from spectral information obtained from the two-dimensional image.

47. (canceled) The method of claim 43 wherein the second deriving step further comprises analyzing the two-dimensional image to find one or more predetermined measurement locations, and deriving one or more measurements from spectral information obtained from the two-dimensional image at the one or more predetermined measurement locations.

48. (new) A CVD system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a CVD process, the system comprising:

a plurality of stations involved in performing one or more aspects of the CVD process;

a wafer transfer mechanism disposed within the system to transfer the wafer between stations;

means for illuminating the wafer while the wafer is transferred between stations;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

a processing means for analyzing said plurality of one-dimensional spectral frames, where said processing means aggregates sequential one-dimensional spectral frames to form two-

dimensional spectral images and analyzes said two-dimensional spectral images to determine a one or more thickness values for one or more of the one or more film layers.

49. (new) The system of claim 48 where said processing means determines a process endpoint.

50. (new) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a CVD process, the method comprising the steps of:

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a sequence of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by a transfer mechanism used to move wafers between one or more storage and one or more process stations;

aggregating said sequence of one-dimensional spectral frames to form a two-dimensional spectral image, and analyzing said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

51. (New) The method of claim 50 where analyzing determines a process endpoint.

52. (New) A CMP system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a CMP process, the system comprising:

a plurality of stations involved in performing one or more aspects of the CMP process;

a wafer transfer mechanism disposed within the system to transfer the wafer between said stations;

means for illuminating the wafer while the wafer is transferred between stations;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

means for processing said plurality of one-dimensional spectral frames, where said processing means aggregates sequential one-dimensional spectral frames to form a two-dimensional spectral image, and analyzes said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

53. (New) The system of claim 52 where said processing means determines a process endpoint.

54. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a CMP process, the method comprising the steps of:

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a sequence of spatially contiguous one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by a transfer mechanism used to move wafers between one or more storage and one or more process stations;

aggregating said frames to form a two-dimensional spectral image; and

analyzing said two-dimensional spectral image to determine a one or more film layer thickness values of a one or more of the one or more films at one or more sites on the wafer.

55. (New) The method of claim 54 where analyzing said two-dimensional spectral image determines a process endpoint.

56. (New) A semiconductor wafer processing system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a process, the system comprising:

a plurality of stations involved in performing one or more aspects of the system process;

a wafer transfer mechanism disposed within the system to transfer the wafer between stations;

means for illuminating the wafer while the wafer is transferred between said stations;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer, and where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

a processing means for analyzing said plurality of one-dimensional spectral frames, where said processing means aggregates sequential one-dimensional spectral frames to form two-dimensional spectral images, and analyzes said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

57. (New) The system of claim 56 where said processing means determines a process endpoint.

58. (New) The system of claim 56 where the process is one of: a CVD process, a CMP process, or a stand-alone metrology process.

59. (New) The system of claim 56 where stations include one of: a load station, an unload station, or a process station.

60. (New) The system of claim 56 where said illuminating means operates in either a pulsed mode or in a continuous mode while said spectral imager detects light.

61. (New) A method of acquiring and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a wafer manufacturing process, the method comprising the steps of:

securing the wafer in a transfer mechanism;

illuminating the wafer with light from a light source;

positioning the wafer using said transfer mechanism so that light from said light source illuminates a desired portion of the wafer;

detecting light from said light source that is reflected from said desired portion of the wafer using a spectral imager disposed to detect light from said illuminating means that is

reflected from the wafer, and where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

analyzing said plurality of one-dimensional spectral frames with a means for processing, where said processing means aggregates sequential one-dimensional spectral frames to form two-dimensional spectral images, and analyzes said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

62. (New) The method of claim 61 where analyzing said two-dimensional spectral image determines a process endpoint.

63. (New) The method of claim 61 where said light source operates in either in a continuous mode, or in a pulsed mode while said spectral imager detects light.

64. (New) A semiconductor wafer processing system that provides and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a process, the system comprising:

a wafer transfer mechanism disposed within the system to transfer the wafer between a load station and a wafer chuck;

means for illuminating the wafer while the wafer is transferred between said load station and said wafer chuck;

a spectral imager disposed to detect light reflected from the wafer and configured to produce a one-dimensional spectral frame while said spectral imager and the wafer undergo relative motion; and

a processor that analyzes said one-dimensional frame to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

65. (New) The system of claim 64 where said processor determines a process endpoint.

66. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a wafer manufacturing process, the method comprising the steps of:

securing the wafer in a transfer mechanism;

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated using said transfer mechanism;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a one-dimensional spectral frame; and

analyzing said one-dimensional spectral frame to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

67. (New) The method of claim 66 where analyzing said one-dimensional spectral image determines a process endpoint.

68. (New) A semiconductor wafer imaging system that acquires and analyzes spectral images of a wafer having one or more film layers prior to and/or following a process, the system comprising:

a first processing system that performs a first manufacturing step on the wafer;

a second processing system that performs a second manufacturing step on the wafer, where said second manufacturing step follows said first manufacturing step;

a wafer transfer mechanism disposed to transfer the wafer between said first processing system and said second processing system;

means for illuminating the wafer while the wafer is transferred between said first processing system and said second processing system;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer, and where said spectral imager is configured to produce one-dimensional spectral frames; and

means for aggregating said one-dimensional spectral frames to form a two-dimensional spectral image and analyzing said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

69. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers between two wafer manufacturing processes, the method comprising the steps of:

using a transfer mechanism to secure the wafer from a first processing system that performs a first manufacturing step on the wafer;

illuminating the wafer with light from a light source;

positioning the wafer using said transfer mechanism so that a desired portion of the wafer is illuminated by light from said light source;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a sequence of contiguous one-dimensional spectral frames while said transfer mechanism moves the wafer;

aggregating said sequence of contiguous one-dimensional spectral frames to form a two-dimensional spectral image;

analyzing said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer; and

transferring the wafer to a second processing system that performs a second manufacturing step on the wafer.

70. (New) A CVD system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a CVD process, the system comprising:

a viewport for providing optical access to said CVD system;

means for illuminating the wafer through said viewport;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and passes through said viewport, where said spectral imager is configured to

produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion; and

means for aggregating said sequence of contiguous one-dimensional spectral frames to form a two-dimensional spectral image, and to analyze said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

71. (New) The system of claim 70 where said aggregating means determines a process endpoint.

72. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a CVD process, the method comprising the steps of:

illuminating the wafer through a viewport with light from a light source;

positioning the wafer so that a desired portion of the wafer is illuminated with light that has passed through said viewport;

detecting light from said light source that is reflected from said desired portion of the wafer and passes through said viewport using a spectral imager configured to produce a sequence of spatially contiguous one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion;

aggregating said frames to form a two-dimensional spectral image; and

analyzing said two-dimensional spectral images to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

73. (New) The method of claim 72 where analyzing said two-dimensional spectral image determines a process endpoint.

74. (New) A semiconductor wafer processing system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a process, the system comprising:

a viewport for providing optical access to said system;

means for illuminating the wafer through said viewport;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and passes through said viewport, where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion; and

means for aggregating said sequence of one-dimensional spectral frames to form a two-dimensional spectral image and to analyze said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

75. (New) The system of claim 74 where said aggregating means determines a process endpoint.

76. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a wafer manufacturing process, the method comprising the steps of:

illuminating the wafer through a viewport with light from a light source;

positioning the wafer so that a desired portion of the wafer is illuminated with light that has passed through said viewport;

detecting light from said light source that is reflected from said desired portion of the wafer and passes through said viewport using a spectral imager configured to produce a sequence of spatially contiguous one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion;

aggregating said frames to form a two-dimensional spectral image; and

analyzing said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

77. (New) The method of claim 76 where analyzing said two-dimensional spectral image determines a process endpoint.

78. (New) A system for obtaining and analyzing spectral images of a wafer having one or more film layers, the system comprising:

means for transferring the wafer;

means for illuminating the wafer; and

a spectral imager disposed to detect light reflected from the wafer, where said spectral imager includes a camera whose components are designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion; and

means for aggregating said plurality of one-dimensional spectral frames to form a two-dimensional spectral image and for analyzing said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

79. (New) The system of claim 78 where said aggregating means determines a process endpoint.

80. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers, the method comprising the steps of:

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated; and

detecting light reflected from said desired portion of the wafer using a spectral imager that includes a camera whose components were designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to produce a sequence of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion;

aggregating with a processor said frames to form two-dimensional spectral images of all or a portion of the wafer; and

analyzing said two-dimensional images to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

81. (New) The method of claim 80 where analyzing said two-dimensional spectral image determines a process endpoint.

82. (New) A spectral imaging system for generating and analyzing spectral images of a portion of a wafer having one or more film layers, the system including:

a first lens assembly for collecting light reflected from said portion of the wafer;

a slit that receives light focused by said first lens assembly and forms a one-dimensional line image from within said portion of the wafer, where said slit restricts the light collected by said first lens assembly to said one-dimensional line image;

a second lens assembly to direct said one-dimensional line image;

a diffractive element to receive light focused by said second lens assembly and to disperse light of said one-dimensional line image in a spectral direction perpendicular to said one-dimensional line image;

a camera whose components were designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to detect said dispersed light to form one-spatial dimension, one-spectral dimension frames of reflectance data; and

a processor for aggregating said frames to form two-dimensional spectral images of said portion of the wafer, and to analyze said two-dimensional spectral images to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

83. (New) The system of claim 82 where said processor determines a process endpoint.

84. (New) A method of generating and analyzing spectral images of a portion of a wafer having one or more film layers, the method including the steps of:

collecting light reflected from said portion of the wafer using a first lens assembly;

restricting the light collected by said first lens assembly using a slit that forms a one-dimensional line image from within said portion of the wafer, where said slit restricts the light collected by said first lens assembly to said one-dimensional line image;

directing said one-dimensional line image using a second lens assembly;

dispersing with a diffractive element said one-dimensional line image in a spectral direction perpendicular to said one-dimensional line image;

detecting said dispersed light with a camera whose components were designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to form one-spatial dimension, one-spectral dimension frames of reflectance data; and

aggregating with a processor said frames to form two-dimensional spectral image of the portion of the wafer, and

analyzing said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

85. (New) The method of claim 84 where analyzing said two-dimensional spectral image determines a process endpoint.